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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/604,835	08/21/2003	Hung-Wei Liu	11437-US-PA	1834

31561 7590 08/24/2004

JIANQ CHYUN INTELLECTUAL PROPERTY OFFICE  
7 FLOOR-1, NO. 100  
ROOSEVELT ROAD, SECTION 2  
TAIPEI, 100  
TAIWAN

EXAMINER

VU, QUANG D

ART UNIT PAPER NUMBER

2811

DATE MAILED: 08/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/604,835

Applicant(s)

LIU ET AL.

Examiner

Quang D Vu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 02 July 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Election/Restrictions*

Applicant's election without traverse of group I (claims 1-10) in the reply filed on 07/02/04 is acknowledged.

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-10 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent No. 6,242,785 to Hossain et al.

Regarding claim 1, Hossain et al. (figures 1-13) teach a method for forming a metal silicide layer, comprising:

providing a silicon layer (silicon gate [14]);

introducing ions (32) in the silicon layer (14) to form a barrier layer (34) in the silicon layer,

forming a metal layer (40) on the silicon layer (14);

performing an annealing process so that the silicon layer reacts with the metal layer to form the metal silicide layer (44) (column 9, lines 20-36); and

removing the unreacted metal layer.

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Regarding claim 2, Hossain et al. teach the ions comprises nitrogen ions (column 8, lines 52-53).

Regarding claim 3, Hossain et al. teach the inert ions includes argon ions (column 8, lines 52-53).

Regarding claim 4, Hossain et al. teach a material of the metal is selected from tungsten (column 9, lines 22-25).

Regarding claim 5, Hossain et al. teach the step of introducing ions in the silicon layer, which is performed by an ion implantation process (column 8, lines 35-55).

Regarding claim 6, Hossain et al. teach (figures 1-13) teach a method of forming semiconductor device, comprising:

- forming a gate structure (14) on a substrate (10), wherein the gate structure comprised a silicon layer (column 6, lines 54-55);

- forming a source/drain region (30) beside the gate structure;

- forming a spacer (22) on the side wall on the gate structure;

- introducing ions (32) into the silicon layer (14) and the source/ drain (30) to form a barrier layer (34) in the silicon layer (14) and the source/drain (30);

- forming a metal layer (40) on the substrate (10);

- performing an annealing process so that the silicon layer and the source/drain react with the metal to form a metal silicide layer (44) (column 9, lines 20-36); and

- removing the unreacted metal layer.

Regarding claim 7, Hossain et al. teach the ions comprises nitrogen ions (column 8, lines 52-53).

Regarding claim 8, Hossain et al. teach the inert ions includes argon ions (column 8, lines 52-53).

Regarding claim 9, Hossain et al. teach a material of the metal is selected from tungsten (column 9, lines 22-25).

Regarding claim 10, Hossain et al. teach the step of introducing ions in the silicon layer, which is performed by an ion implantation process (column 8, lines 35-55).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quang D Vu whose telephone number is 571-272-1667. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on 571-272-1732. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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qv

August 20, 2004

A handwritten signature in cursive script, appearing to read "Kang Donghee".

**DONGHEE KANG**  
**PRIMARY EXAMINER**